

What is claimed is:

1. Apparatus for deployment of a hemostatic clip comprising:

a handle assembly;

a shaft connected to a distal portion of the handle assembly;

a clip assembly releasably coupled to a distal portion of the shaft, the clip assembly including clip arms and a capsule cooperating with the clip arms to provide a first user feedback indicating a decision configuration of the clip assembly; and

a control wire including a ball connector, the control wire extending from the handle assembly and coupled to the clip assembly by the ball connector to maintain the clip assembly coupled to the shaft, wherein the ball connector is detachable from the clip assembly to provide a second user feedback indicating separation of the clip assembly from the shaft.

2. The apparatus according to claim 1, further comprising an over sheath movable between a first position covering the shaft and the clip assembly and a second position uncovering the clip assembly.

3. The apparatus according to claim 2, further comprising an over sheath stop engageable on the shaft to prevent movement of the over sheath to the second position.

4. The apparatus according to claim 1, wherein the clip arms further comprise stop shoulders engaging a distal end of the capsule to provide the first user feedback during proximal movement of the control wire.

5. The apparatus according to claim 1, wherein the decision configuration indicates a position of the control wire beyond which further proximal movement of the control wire precludes return of the clip arms to an open configuration by a reversed movement of the control wire.

6. The apparatus according to claim 1, wherein the capsule further comprises:

a yoke including a ball cavity and being slidable within the capsule, the yoke receiving the ball connector in the ball cavity; and

a tension member releasably connected to the yoke, the tension member being connected to the clip arms and biasing the clip arms toward an open configuration, wherein the tension member releases from the yoke when the control wire is moved proximally beyond the position at which the first user feedback is provided.

7. The apparatus according to claim 6, wherein the tension member and the yoke are releasably connected to one another by a male C section member and a female C section member.
8. The apparatus according to claim 7, wherein separation of the yoke and tension member occurs by one of fracture and deformation of the male C section member.
9. The apparatus according to claim 8, wherein separation of the yoke and tension member occurs when a tension on the control wire tension is at least a predetermined separation tension.
10. The apparatus according to claim 9, wherein the separation tension is at least approximately 4 lbf.
11. The apparatus according to claim 9, wherein the separation tension is less than approximately 12 lbf.
12. The apparatus according to claim 6, wherein separation of the yoke and tension member locks the clip arms in a closed configuration by sliding the tension member and the clip arms proximally within the capsule.
13. The apparatus according to claim 6, wherein separation of the yoke and tension member allows proximal movement of the yoke to release the capsule from a bushing of the shaft.
14. The apparatus according to claim 6, wherein distal movement of the control wire, before separation of the yoke from

the tension member, slides the clip arms distally out of the capsule into an open configuration.

15. The apparatus according to claim 1, wherein the first feedback includes a tactile and aural feedback.

16. The apparatus according to claim 1, wherein the control wire further comprises a reduced diameter section adjacent to the ball connector, the reduced diameter section yielding when a tension in the control wire reaches a predetermined yield tension.

17. The apparatus according to claim 16, wherein the yield tension is greater than the separation tension.

18. The apparatus according to claim 16, wherein the yield tension is between approximately 10 lbf and 20 lbf.

19. A clip deployment apparatus insertable to locations within a body through an endoscope, the apparatus comprising:

an elongated member extending from a proximal end to a distal end;

a control wire extending from the proximal end of the elongated member to the distal end thereof;

a bushing coupled to the distal end of the elongated member;

a capsule releasably connected to the bushing;

clip arms slidable within the capsule between a distal open configuration and a proximal closed configuration;

a tension member slidable with the clip arms, the tension member biasing the clip arms toward the open configuration; and

a yoke slidable within the capsule, a first end of the yoke being releasably connected to the tension member and a second end of the yoke being connected to the control wire, wherein distal movement of the control wire slides the clip arms into the open configuration, and proximal movement of the control wire slides the clip arms into the closed configuration.

20. The apparatus according to claim 19, wherein each of the clip arms comprises a radius section and wherein the capsule comprises a plurality of overhangs cooperating with the radius sections to retain the clip arms in the closed configuration when the clip arms are moved proximally within the capsule.

21. The apparatus according to claim 19, wherein each of the clip arms comprises stop shoulders and wherein the capsule comprises a plurality of distal folding tabs cooperating with the stop shoulders to provide a first user feedback indicative of proximal movement of the clip arms through a selected position in the capsule.

22. The apparatus according to claim 21, wherein the first user feedback includes an aural component and a tactile component.

23. The apparatus according to claim 21, wherein proximal movement of the control wire beyond a point at which the clip arms are in the selected position results in separation of the yoke from the tension member.
24. The apparatus according to claim 23, wherein separation of the yoke from the tension member precludes returning the clip arms to the open configuration.
25. The apparatus according to claim 23, wherein separation of the yoke from the tension member allows further proximal movement of the yoke to release the capsule from the bushing.
26. The apparatus according to claim 19, further comprising a ball and socket connection between the yoke and the control wire.
27. The apparatus according to claim 26, wherein the ball and socket connection includes a ball detachably coupled to a body of the control wire when a tension on the control wire is at least a predetermined separation tension, the ball providing a second user feedback when separated from the body of the control wire.
28. A method for hemostatic clipping comprising:
- inserting a shaft of a clipping device through a working lumen of an endoscope, wherein the shaft extends to a distal clipping assembly of the clipping device including a plurality of clip arms and wherein a control wire extends through the shaft from the clipping assembly to a handle coupled to a proximal end of the shaft;

manipulating the handle assembly to move a control wire within the shaft to move the clip arms between an open and a closed configuration;

generating a first user feedback indicating a decision configuration of the apparatus; and

generating a second user feedback indicating separation of the clipping assembly from the shaft.

29. The method according to claim 28, further comprising covering the shaft and the clipping assembly with an outer sheath.

30. The method according to claim 29, sliding the outer sheath proximally to uncover the clipping assembly.

31. The method according to claim 28, wherein the clipping assembly further comprises a capsule slidably containing a yoke and a tension member biasing the clip arms toward the open configuration, the yoke being coupled to the control wire and being detachably coupled to the tension member.

32. The method according to claim 28, wherein giving the first user feedback comprises providing a resistance force slowing proximal movement of the clip arms and increasing a resistance to a corresponding movement of the handle assembly.

33. The method according to claim 32, wherein the clip arms comprise stop shoulders and wherein the clipping assembly comprises a capsule into which the clip arms are drawn

proximally, wherein the stop shoulders cooperate with a distal end of the capsule to generate the resistance force.

34. The method according to claim 28, further comprising separating the yoke from the tension member when a tension applied to the control wire after generation of the first user feedback is at least a first pre-selected tension.

35. The method according to claim 26, wherein the second user feedback is generated when a reduced diameter portion of the control wire yields when a tension applied to the control wire is at least a second pre-selected tension.

36. The method according to claim 26, wherein the second pre-selected tension is greater than the first pre-selected tension.